Useful information:

* What is feature extraction?
* Feature extraction is the process of selecting and transforming raw data into a set of features that can be used as input variables for a machine learning model. In forecasting, feature extraction involves identifying the key variables or attributes that are likely to have a significant impact on the outcome of interest and converting them into numerical representations that can be used as input for a forecasting algorithm.
* The goal of feature extraction in forecasting is to reduce the complexity of the raw data and extract the most important information from it. This can involve transforming the data using statistical methods such as scaling, normalization, or smoothing, or creating new features based on domain knowledge or data analysis.
* The extracted features are then used as input for a forecasting model, which can be a wide range of models such as time series models (e.g., ARIMA, Prophet), machine learning models (e.g., random forests, neural networks), or hybrid models that combine both approaches.
* Effective feature extraction is a critical component of accurate forecasting, as it can significantly impact the performance of the resulting model. Good feature selection and transformation can improve the accuracy, stability, and interpretability of the forecasting results, while poorly chosen or transformed features can lead to inaccurate or unstable forecasts.
* What is the portmanteau Ljung-box test?

The Portmanteau test, also known as the Ljung-Box test, is a statistical test used in time series analysis and forecasting to check for the presence of autocorrelation in a residual series.

After fitting a time series model to a data set, it is important to check the residuals of the model to ensure that they are not exhibiting any patterns or correlations. The presence of autocorrelation in the residuals can indicate that the model is not capturing all of the important patterns in the data, and can lead to inaccurate forecasts.

The Portmanteau test checks for the presence of autocorrelation in the residuals by testing the null hypothesis that the residuals are independently and identically distributed (IID) with a normal distribution. If the p-value of the test is less than a chosen significance level (e.g., 0.05), then we reject the null hypothesis and conclude that there is evidence of autocorrelation in the residuals.

The Portmanteau test is a useful tool in forecasting as it allows us to check the adequacy of a time series model and the independence of its residuals. If the test indicates the presence of autocorrelation in the residuals, it may be necessary to modify the model or consider alternative models to improve the accuracy of the forecasts.